

# Prototype-Technology Evaluator and Research Aircraft (PTERA) Flight Test Assessment, Phase I

Completed Technology Project (2012 - 2012)



## Project Introduction

The Area-I team has developed and fabricated the unmanned Prototype-Technology Evaluation and Research Aircraft or PTERA ("ptera" being Greek for wing, or wing-like). The PTERA is an extremely versatile and high-quality, yet inexpensive flight research testbed that serves as a bridge between wind tunnel and manned flight testing by enabling the low-cost, low-risk flight-based evaluation of a wide array of high-risk technologies. For this work, the team proposes a flight test evaluation of the PTERA platform to assess its effectiveness as a research test bed aircraft within NASA's Aeronautical Test Program (ATP). The PTERA stands to enhance the already capable ATP by enabling the low-cost, low-risk flight-based evaluation of everything from advanced aerodynamic treatments to sensor payloads. Several core capabilities that the PTERA would bring to the ATP: 1) A low-cost, low-risk flight test facility that can be used to expand ATP's role in the testing and validation of NASA's physics-based multi-disciplinary analysis and optimization (MDAO) tools 2) The ability to flight test advanced aerodynamic treatments, health management and control systems, and to perform experiments in structures and aeroelasticity for a fraction of the cost of a manned flight test program 3) The ability to flight test cutting-edge and complex systems whose cost and risk are too high for manned flights 4) A testbed with modular airframe, enabling the evaluation of multiple technologies with the same airframe 5) A testbed with a large payload capacity that facilitates the inexpensive and risk-mitigating flight test evaluation of a wide array of sensors and payloads as well as the evaluation of flight-test measurement systems before they transition to manned programs 6) The ability to perform unmanned, autonomous, flight experiments relating to the burgeoning field of autonomous unmanned aircraft, including experiments supporting UAS integration in to the NAS, sense and avoid, etc.



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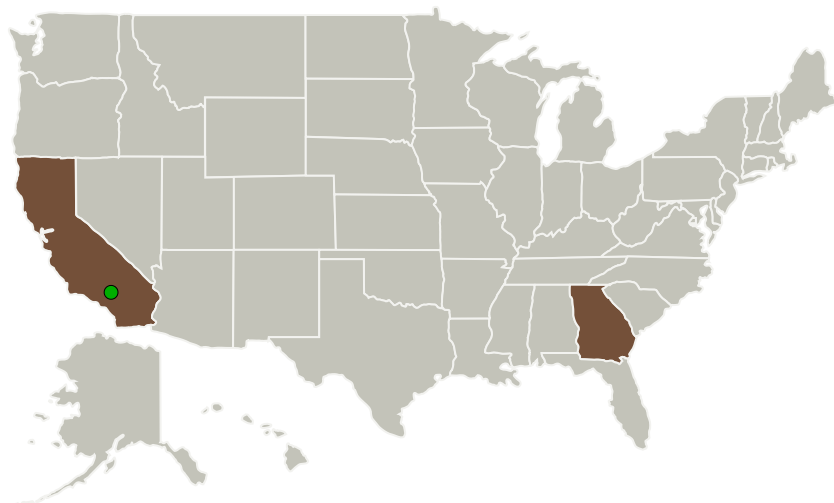
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## Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Area-I, Inc.	Lead Organization	Industry	Kennesaw, Georgia
● Armstrong Flight Research Center(AFRC)	Supporting Organization	NASA Center	Edwards, California

Primary U.S. Work Locations	
California	Georgia

## Project Transitions

**February 2012:** Project Start

**August 2012:** Closed out

### Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/140685>)

## Organizational Responsibility

### Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

### Lead Organization:

Area-I, Inc.

### Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

### Program Director:

Jason L Kessler

### Program Manager:

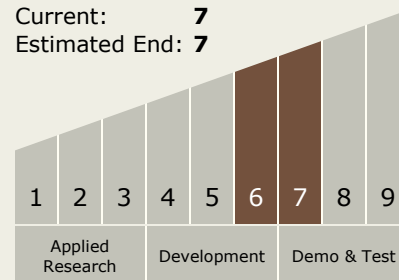
Carlos Torrez

### Principal Investigator:

Nicholas R Alley

## Technology Maturity (TRL)

Start: 6  
Current: 7  
Estimated End: 7



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## Technology Areas

### Primary:

- TX15 Flight Vehicle Systems
  - └ TX15.2 Flight Mechanics
    - └ TX15.2.3 Flight Mechanics Testing and Flight Operations

## Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System